

**Food Security and Nutrition Monitoring Systems and the Food Crisis:
Lessons from the Last Three Decades¹**

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ABSTRACT

Designing food security and nutrition policies and programs, monitoring their implementation, evaluating their benefits and costs, and assessing their impact on the target population crucially depend on the national information systems that collect, process, and analyze data and inform policymakers about needed action. Yet in several developing countries, such systems continue to be poorly organized, inadequately resourced, and weakly implemented. A better understanding of the operational challenges of designing and implementing food policy systems in developing countries can help improve food policy decision making. This paper reviews the historical development of food security and nutrition monitoring systems and their role in responding to food security and nutrition emergencies in terms of evidence-based policy making and program design. Drawing from a series of consultations in 12 developing countries and two regional consultations in South Asia and sub-Saharan Africa between 2009 and 2012, this paper discusses the issues, constraints, and challenges faced by policymakers in establishing and effectively using food security monitoring systems for policymaking and program interventions during the recent food crisis (2008-2010). It analyzes elements of institutional architecture and mutual accountability within the food policy process that enable the effective use of information in food policymaking. It identifies the roles of individual, institutional, and system capacity in designing and implementing food security and nutrition monitoring systems in the context of developing resilient food systems, transforming the agriculture sector, and linking agriculture to nutrition and health. The paper summarizes lessons learned for strategic investment in monitoring systems over the last thirty years. The paper concludes that a food policy system that is responsive to policymaking needs and is demand-driven, well-resourced, and accountable to its data generators and users is more likely to be successful and sustainable.

Keywords: Food security, malnutrition, monitoring, evaluation, policy systems, developing countries

I. Introduction

“Stronger assessment, monitoring, and surveillance systems are needed to better prepare for tomorrow’s crises and to ensure that actions taken by governments and the international community are minimizing risks and mitigating the effects of high food prices on the most vulnerable.”

--- Comprehensive Framework for Action for Addressing the Food Crisis by the UN Secretary General (2009)

The recent global food crisis emphasized the importance of evidence-based policymaking and program design to food policymakers in developing countries. Countries continue to face localized food crises from the recurrent drought-related emergencies. For example, the recent famine-like conditions in the Horn of Africa affected 12 million people in 2011 (the fourth such event in the last ten years) and another major weather-induced food crisis affected 18 million people in the Sahel (the third such event in the last eight years). Reports indicate that such events kill thousands of people and displace millions (UN, 2009). Over the years, food security and nutrition monitoring systems, as part of broader food policy systems, have helped in forewarning policymakers and program managers of the impending food crisis. Yet the design and implementation of food security and nutrition monitoring (FSNM)² systems continue to face a number of constraints and challenges. However, much progress has been made to mainstream the information and knowledge system for food security and nutrition monitoring.

Past experiences show that food crises emerge slowly, thus with effective forecasting using food security and nutrition indicators and careful monitoring of food prices, rainfall levels, and crop production losses, it is possible to guide policymakers and humanitarian agencies to act early to minimize the impact of the food crisis and to prevent major disasters and human loss. Early action saves both lives and costs. A major challenge that continues to plague the development community is the weak link between information systems and policy and program action. This is largely due to weak capacity to design and implement early actions to prevent the crisis from unfolding. The amount of time taken to gather information and to translate it into action is so large that by the time aid is organized, it is too late to effect results on the ground. The situation is so pervasive that it still continues. While the food crisis provides context to take a critical look at the existing food security and nutrition monitoring systems, the principles and practice of improving their relevance, design, effectiveness, efficiency, sustainability, and impact also apply to regular short, medium, and long term food policymaking.

In this paper, we look at the development and implementation of food security and nutrition monitoring systems over the last thirty years and more critically in the context of the recent food crisis to identify policy, institutional, organizational, and system capacity challenges. We present lessons that could be useful to overcome these challenges at the global, regional, and national levels.

² The term, food security and nutrition monitoring, encompasses a wide range of institutional and organizational arrangements at the country, regional, and global levels for evidence-based policymaking. It includes developing and sustaining data and knowledge systems, monitoring and evaluation mechanisms, policy and program development processes, and impact assessment. It has its origins in the data-based information systems that were initiated in the 1980s both in the food security sector (national early warning systems) and nutrition sectors (nutritional surveillance systems) to inform policy and program design to address food security and nutrition challenges. These systems address a wide range of policy and program needs including, early warning, program design and evaluation, and policy design and implementation.

The paper is organized as follows. In the next section, we develop a conceptual framework for analyzing the relevance, effectiveness, efficiency, impact, and sustainability of FSNM systems. We apply this framework to understand how FSNM systems in select developing countries responded to the recent food crisis in Section III. In Section IV, we draw lessons for overcoming the challenges of effectively implementing FSNM systems. Concluding remarks form the last section.

II. A brief history and a conceptual framework for analyzing food security and nutrition monitoring systems

Food security and nutrition monitoring (FSNM) systems can play an important role in identifying, analyzing, and addressing food security and nutrition challenges through policy and program solutions. FSNM systems can provide necessary and timely information to decision makers for building sound policies and programs. While there is high recognition of the roles that various components of FSNM systems can play, there is limited understanding of the issues, constraints, and challenges that face the development and implementation of such systems in developing countries [UN, 2009; Pinstруп-Andersen 2009]. In this section, we present a brief survey of some of the major issues discussed in the limited literature on the food crisis.

Definitions of FSNM systems vary and have evolved over the years depending on the nature and magnitude of the problems at hand. They have also evolved along with the definitions of food security, nutrition security, and famine. How practitioners define food and nutrition security is likely to influence what indicators are monitored, thus affecting policymaking. Recently, definitions of food security have expanded to include a resilience and stability dimension (Dorwood, 2011?) (ref from 2nd edition). Thus, stability indicators, such as those that assess the role of increasing food price volatility on the food security and nutritional status of a population, must also be tracked [Glantz, MH]. The spatial and time dimensions of food security issues make the units of indicators complex, especially when looking at aggregated data at the national, regional, and global levels. For the purposes of this paper, a food security and nutrition monitoring system is defined as “a process of policymaking and program design through generating evidence, monitoring, analysis and the interpretation of indicators and causal factors associated with food security and nutrition, in order to make appropriate decisions that will lead to effective interventions which result in improvements in the food security and nutritional status of the population” [Babu and Quinn, 1994].

The objectives of FSNM systems have changed over the years. There are usually five main objectives: (1) timely (early) warning and intervention; (2) development planning and policy design; (3) program management and evaluation; (4) problem identification and advocacy; and (5) monitoring impact of special programs and policies. Each objective has particular information needs, yet the information obtained for one objective may be of use to fulfill some of the other objectives as well.

The main purpose of an early warning system is to gather data that monitors people’s access to food so as to predict or foresee an imminent food crisis and to therefore initiate a timely response, particularly in nations regularly burdened by drought and famine [Devereux and Maxwell 2000 and Buchanan-Smith]. FSNM systems that are intended to serve the needs of development planning and policy design attempt to satisfy the “information needs of planners, policy analysts, and policy decision makers at the local, regional, and national level” [Babu and Pinstруп-Andersen, 1994]. Program management and evaluative FSNM systems are generally designed to help program managers, officials, and donors in the implementation and assessment of existing programs, such as determining whether the programs successfully reached the targeted populations [Tucker K et al., 1989]. A monitoring system for problem identification and advocacy collects and interprets information on nutritional indicators, in order to

determine the quantity of resources needed to address a specific problem (Habicht, 2000). Special programs and policies that address issues arising from globalization, World Trade Organization (WTO) agreements, or climate change-related weather events can often have negative impacts on different segments of a population. Hence the consequences of such events on the food security and nutritional conditions of the poor need to be monitored. The information derived from such monitoring systems is important for targeting aid and improving future policies [Babu and Pinstруп-Andersen, 1994; Pinstруп-Anderson 2009].

The food emergencies of the 1980s and the food security and nutritional consequences brought the importance of nutritional surveillance to the attention of global decision makers (Mock and Mason, Habitat and Pinstруп-Andersen, 1990). At the same time, early warning systems were established at national and regional levels to support food and nutrition policymaking and program interventions (GIEWS, 2013). Regional systems tend to be better supported than national systems which struggle to produce the information needed by national policymakers in the event of a crisis (UN, 2009). In general, the commitment of policymakers to evidence-based decision making has been low.

In the early stages of the development of monitoring systems, there was more focus on the data collection mechanism, and little attention given to the effective conversion of data into information and of information into policy. Although much data was collected, only a portion of it was analyzed and only a portion of the analyzed data was used in policy and program design. Differing sectoral needs for information and a lack of consensus on the purpose, assumptions, and methods of monitoring for various sectors such as agriculture, food, health, and nutrition presented additional challenges to the improvement and sustainability of the monitoring systems. Finally, weak capacity at the individual, organizational, and system levels have been a chronic challenge in effectively using the monitoring systems for policy and program intervention (Pelletier and Jonsson, 1994)

The 1990s brought efforts to establish coordinated regional early warning systems, most notable of which was the South African Development Community (SADC) regional system [6]. In support of the SADC Regional Food Security Programme, a regional early warning system (REWS) was initiated in 1987. As many of the nations in the SADC faced common problems such as periodic droughts, conflict, and high population growth, it was acknowledged that “timely, accurate, and reliable” information was crucial to achieving food security [FAO, 1997]. The Food and Agriculture Organization (FAO) created the Global Information and Early Warning System (GIEWS) following the 1974 World Food Conference. It is the primary supplier of “information on food production and food security for every country in the world,” and consists of a network of numerous governments, NGOs, and research organizations [GIEWS 2013]. GIEWS assists in national and regional efforts to improve food security information and early warning systems. For example, it has helped sub-Saharan African nations launch national early warning systems (NEWS) [SADC, 2013]. Other examples of monitoring on a regional or global scale include the Famine Early Warning Systems Network (FEWS NET) and the Global Monitoring for Food Security (GMFS) project.

The objective of FEWS NET, an example of regional coordination in monitoring, is to develop “more useful and sustainable” food security information systems in sub-Saharan Africa [FEWSNET, 2013]. FEWS NET strives to enable Africans to determine existing food security problems and to support Africans in solving these problems themselves, particularly by enhancing African capacity to increase the “quality and effectiveness of food security information systems and networks” [FEWS, 2013].

During the last decade, a number of countries have moved beyond food security monitoring for crisis management to medium- and long-term planning. For example, the New Partnership for Africa (NEPAD) developed a peer review mechanism and the Comprehensive Africa Agriculture Development Programme (CAADP) provided support for national entities running food security and nutrition monitoring systems. The broad goal of CAADP is to increase the income of farming households, reduce poverty and hunger, and increase food and nutrition security. These development goals are seen as indicators of development outcomes. In order to achieve these development outcomes, CAADP countries are supported to achieve six percent growth in the agriculture sector by committing ten percent of the government budget to the agriculture sector. In recent years, the food security and nutrition monitoring process has brought together public, private and civil society organizations as well as donors to design policies and programs and to track the progress made while holding stakeholders mutually accountable (CAADP, 2003; ReSAKSS, 2013).

At the global level, in response to the 2007-08 food price crisis, the United Nations' (UN) High Level Task Force on Global Food Security updated its Comprehensive Framework for Action calling for a strengthening of food security and nutrition assessment systems for informed policymaking. Continuous tracking of the indicators and causal factors of food insecurity and malnutrition was seen as a priority to minimize the impact of high global food prices on vulnerable populations. These information generation systems and their use in decision making need to be strengthened at the country, regional and global levels. The agencies that participate in the UN High Level Task Force on Global Food Security responded in different ways to collect and organize information. For example, the FAO's Food Price Data and Analysis Tool was developed to monitor food prices at the country level. The FAO also regularly produces food supply data. The World Food Programme (WFP) responded by conducting vulnerability assessment mappings of hunger and the factors affecting food insecurity. It identified the most vulnerable countries in need of intervention assistance.

In addition, the UN developed the Global Impact and Vulnerability Alert System (GIVAS), "consisting of a Global Impact and Vulnerability Data Platform and a series of Global Alert products, to track developments, and report on the political, economic, social, and environmental 40 dimensions of a crisis." (UN, 2009). GIVAS attempts to provide real time data and analysis for timely response by the international community. However, the quality of the data collected through GIVAS crucially depends on the capacity of the national institutions and their monitoring systems to provide this data. Thus, the global, regional, and national systems depend on the same capacity and infrastructure for generating quality and reliable data for decision making at various levels.

Understanding the various components of a country's FSNM system and how they come together to contribute to intervention policies and programs requires addressing several related questions. How well are the various stakeholders of the policy process in a country brought together? What institutional architecture currently exists to address the challenges of FSNM systems and related program challenges? Does the information gathered, analyzed, and reported satisfy information needs? How does the information affect policy decisions and how does feedback from policy implementation feedback into the policy process? What demand exists from the policy makers for the information generated by FSNM? Who decides what information to be collected? What capacity strengthening issues need to be addressed to make the evidence-based decision making sustainable?

In order to answer these questions, the various components of FSNM systems need to be evaluated to determine their functionality, including examining their cost-effectiveness and the accuracy of the data

produced. In this section, we develop a conceptual framework for evaluating FSNM systems in developing countries.

At the country level, a food security and nutrition monitoring system involves various actors, players, and stakeholders from the public sector, private sector, civil society organizations, and donor organizations. Periodic review of the progress made by each country to achieve their food security and nutrition objectives is the responsibility of the policy system. Government commitment to organize and coordinate sector level reviews is a prerequisite to make effective use of the FSNM systems. One of the key inputs of the food and agriculture sector progress reviews should be information on the state of household food security and nutritional status as well as the factors that influence them. It is also important to assess the impact of food security and nutrition. A major challenge that countries faced in the past is the varying degrees of interest in the use of evidence in making food security and nutrition related decisions. Identifying such challenges and constraints in the functioning and use of FSNM systems is the first step to increasing their sustainability [NeKSAP, 2010; Devereux and Maxwell 2000].

Figure 1 presents a conceptual framework for evaluating FSNM systems. We view this evaluation as a cyclical one, as the system itself is cyclical. A sound food security and nutrition monitoring system is simple, user-driven, and based on existing institutional structures (which increases the capacity for analysis and interpretation). It also has the commitment of the relevant decision makers who will use the system's outputs in planning and policy design. Tracking deviations of the implementation of an FSNM system from these evaluative criteria helps to reorient activities toward the ultimate goal of developing informed food security and nutrition policy decisions.

A fundamental factor that determines the sustainability of FSNM systems is the user-driven nature of the objectives that dictate what information is generated. Operational linkages between the monitoring system and the institutions using the generated information need to be in place for the system to be successful in triggering appropriate policy and program response [Babu SC, Tashmatov A, 1999 and FAO, 1997].

The quality of data and the speed at which it is generated is determined by the simplicity of the instruments used for gathering information. The use of existing infrastructure for collecting and compiling information has proven to be more successful than the creation of new institutional structures for the purposes of FSNM. FSNM systems can and should utilize traditional methods used by local communities for early warning purposes [Buchanan Smith and Cosgrave, 2010; ACF 2011].

FSNM systems should be evaluated on the accuracy of the data they produce as well as their capacity for data processing, analysis, and interpretation. It is important that the information generated arrives in a timely fashion, giving decision makers enough leeway to produce the necessary policy responses. These decision makers should be committed to using the data produced by these systems.

The cost of generating information should be weighed against the benefits of the policy or program impacts developed based on the outputs of the monitoring systems (Babu and Mthindi, 1995; Babu and

Reidhead,). Although it is generally argued that such benefits are not readily quantifiable, one approach is to document the use of information from FSNM systems for various planning and policymaking purposes on a case-by-case basis and estimating cost-savings compared to generating the information separately. Donors frequently raise the issues of the costs of FSNM systems, however, very few attempts have been made to measure the actual costs and benefits to justify this concern. Empirical evidence from Malawi indicates that the internal rate of return to FSNM ranges from 66 to 75 percent [Babu, et al, 1996]. Another study shows that every dollar spent on mitigation saves approximately \$4-10 in recovery costs [Babu SC, Chapasuka E. 1997].

It is conceivable that donor agencies use some of the information collected by monitoring systems in their planning exercises hence saving their resources that would otherwise be used for data collection. These benefits are additional to the local benefits for which the monitoring system were originally intended. Furthermore, transparency in the use of data and increased sharing of data will enable a faster response to food emergencies and limit the replication of data collection efforts [USAID].

Food security monitoring should be coupled with institutional development, so that the information generated can be effectively used in decision making. Past experiences with FSNM systems indicate that there is a tendency toward using short-term technical assistance in generating data from the field. Even with long-term projects, such as the ones implemented by the FAO, there has not been an adequate allocation of resources to develop institutional and human capacity to sustain monitoring systems.

Monitoring the use of information in designing policies and interventions and evaluating the impact on policy decisions is important for identifying new channels for information dissemination. Information obtained from evaluating the benefits of monitoring systems via influencing policies can be a useful instrument for raising resources and support for sustaining the systems. Monitoring and evaluating the impact of the monitoring systems in influencing policy decisions requires constantly following up on the information generated and its use at various stages of decision making. This requires concerted efforts by the program managers of the monitoring systems. The benefits of such documentation, however, outweigh the time and costs involved.

III. Food security and nutrition monitoring and the food crisis

In this section, we use the conceptual framework developed above to analyze how countries used their FSNM systems to develop responses to the food price increases. The synthesis presented in this section is based on the in-country and regional consultations in selected countries in 2009 and 2010 in South Asia, Southeast Asia and sub Saharan Africa. In addition, a number professionals involved in the development and implementation of FSNM systems, food security taskforces, think tanks, and policymakers were interviewed in each of the countries to identify the role of FSNM systems in each country's response to the crisis.

We first look at the responses the countries developed to address the food crisis and then identify the organizational and institutional structures that helped to provide evidence, data, and information for the decision making process. We then the study the characteristics of the FSNM systems that provided evidence and information support for the policy responses to draw broader lessons on how to improve the effectiveness of the monitoring systems.

Countries responded differently to the food crisis based on the nature and magnitude of the impact of global food price increases on local prices and the country's food security. A brief summary of the responses to the food crisis in select countries are presented in Table 1 below. Responses to the food

crisis varied depending on the type of policy problem, the resources at the disposal of the governments, and the type of evidence on which the policymakers have to base their decision.

The developing country governments analyzed here chose responses that ranged from increasing incentives for production to market interventions, such as export bans and import tariffs. The responses of these countries can be put into one of two categories: supply-oriented responses and demand-oriented responses. Subsidies for production inputs, such as chemical fertilizers and seeds, or for the adoption of modern technologies were the most common policies to augment food supply. For example, Malawi further strengthened its already well-established fertilizer subsidy program. Other countries, such as India and Kenya, maintained their input subsidy programs to encourage farmers to continue to produce. To meet the domestic demand for food and to bring down the rising food prices, India imposed an export ban on its rice and wheat, Vietnam banned rice exports, and Malawi banned the export of maize to its neighbor Zimbabwe. Ethiopia and Nigeria responded by releasing food stocks in their domestic markets in order to stabilize domestic food prices.

On the demand side, safety net programs were strengthened in India, Bangladesh, and Ethiopia to protect their most vulnerable populations. The programs were mainly implemented through already existing programs, such as food for work, cash transfer programs, or guaranteed employment programs. For certain essential commodities, such as rice and pulses, Bangladesh and India resorted to selling these commodities in strategic selling points to benefit urban consumers directly.

These policy and program responses have been well advertised in the media to increase transparency and to appease the countries' opposition parties (Watson, 2012). The use of information and evidence in various policy and program measures varied according to the type of domestic pressures that each country government faced during the food crisis. The nature of the political environment, the level of decentralization, and the sensitivity of the policymakers to the reactions of the consumer and producer groups also affected the information use and the time taken to respond to the food crisis. Ruling parties in democratic countries, such as India and Bangladesh, responded to avoid criticism from their opposition parties. In Nigeria, the major push for government action came from the consumers taking to the street. Although not fully democratic, the Vietnamese government reacted to avoid any suffering of the vulnerable group due to high food prices.

Use of information and evidence in the food policy processes differed depending on several factors. In large countries such as India, which reacted to higher food prices in global markets by imposing an export ban on rice, did so after quick consultations with local think tanks that are supported by the government. Data on food availability in various states, which was routinely collected and published by various state and central publications, was used by researchers to alert the policymakers. However, the policy process was so quick; there was little time for researchers and analysts to evaluate the policy options.

In small countries like Malawi, the decision to back maize exports came from a policy announcement by the President to nullify fears that higher food prices will increase informal cross border trade in food grains leaving Malawians with no food in their communities. However, in developing the policy measures and program interventions that followed food crises, many countries used the existing information collection infrastructure to assess the food security conditions on the ground. For example, Malawian policymakers frequently used the FEWS NET bulletins in their discussions and for monitoring food availability in various parts of the country. Yet the capacity to produce such information is severely lacking in public institutions.

In the rest of this section, we look at the characteristics of FSNM systems to analyze how various organizational and institutional structures interacted to develop and implement the policy responses identified above.

Table 1: Summary of policy responses to the food crisis and related policy processes in select developing countries

Country & Policy problem triggered by the food price crisis	Example of food policy responses and information needs
<p>Bangladesh: Sharpe rise in food prices in domestic markets. Significant number of households sliding into poverty. Increased vulnerability of marginalized groups.</p>	<p>Long-term food security goals such as price support, fertilizer and fuel subsidies maintained. Net-importing, yet 4th largest rice producer in the world. Increased allocation of funds for social safety nets. Built higher food stock and reduced import tariffs on food for open market sales in urban areas. Banned rice exports and eliminated import duty on rice and wheat.</p>
<p>Ethiopia: Chronic food insecurity and low productivity of agriculture accentuated by the food price increase.</p>	<p>Imposed export ban on all cereals crops. Released grain stocks to distribution centers and to grain mills. Targeted food distribution to affected population.</p>
<p>India: Food price increase at the international level had little direct influence on domestic prices. However, high domestic food inflation was criticized by opposition parties and civil society organizations; structural change in demand for high value commodities combined with poor supply response</p>	<p>Ban on common rice and wheat exports. Additional procurement of wheat was doubled in 2008/09. Government proactively increased the support price for major cereals, increased the food subsidies, released the food stocks in open markets, and increased the fertilizer subsidy.</p>
<p>Kenya: Food prices began steadily increasing since 2007. Policy distortions and under provision of public goods were identified as major causes of food insecurity and reinforced by high food prices.</p>	<p>Policy responses were slow. Policy responses included producer support policies and other supply side interventions. Increased importation of food grains to build up domestic stocks. Reduction of wheat import tariff and suspension of maize import tariff.</p>
<p>Malawi: Export of maize forging ahead with input subsidies during the crisis. Media criticized the government.</p>	<p>Ban on export of maize. Restriction on private domestic trade. Commitment to produce additional maize through fertilizer subsidy. Export commitments not kept; strategic grain reserves.</p>
<p>Mozambique: Domestic food prices continued to rise even after the international prices started to decline resulting in demonstrations on the streets of Maputo by the end of 2010.</p>	<p>Reduced import tariffs in early 2008, cut the tariffs of maize, wheat, and rice from 25 percent to 2.5 percent. Trade policy measures were generally effective in reducing the international price shock impact.</p>
<p>Nigeria: Droughts in some parts of the country; growing food shortages in many parts of the country.</p>	<p>Released stocks of food grains and increased rice imports. Emergency meeting of governors. Increased fertilizer subsidy and other subsidies for small scale machines. Implemented guaranteed minimum price, commercial agricultural credit program, and national food crisis response program</p>
<p>Vietnam: Although a major rice exporter, increase in international prices was seen not as an opportunity to increase the income of rice farmers. Poor consumers in rural and urban areas became vulnerable to food price increases.</p>	<p>Export ban on rice preceded by lowering the rice export quota. Domestic food grain market was fully liberalized. Fulfilling domestic demand for rice became the prime policy objective of the government. Procured rice from farmers and built up food stocks.</p>

Table 2 presents the current status of the FSNM systems in the eight countries where consultations were held following the food crisis. To understand the nature of the monitoring systems, key informants were interviewed in each of the countries. This provides a snap shot of how the FSNM systems were organized and used when developing responses to the food crisis in each of the countries.

Bangladesh: When the food crisis hit Bangladesh, the necessary infrastructure for information collection was in place. However, the capacity for data analysis and policy decision making was severely constrained. The Ministry of Food quickly put together a team, under the leadership of the Director General of Food in the Ministry of Food, to take a crash course on food policy analysis in India. This helped to better organize the data and improve the use of it for program targeting and implementation, especially to address the problems of most vulnerable populations. At the national level, the Ministry of Commerce and the Ministry of Food worked together to identify policy options that will ensure an adequate supply of food in the country. Governance of tendering system was particularly effective in involving the private sector. However, a lack of coordination among the agencies and ministries involved in agriculture, food, commerce, trade, and health to develop food policy responses was a major challenge. Business associations pressured the government to act based on the food price data available in the public domain.

A food crisis task force was commissioned but it was ineffective due to coordination problems. However, the limited consultations did involve major civil society organizations in discussions and decision making. Due to a lack of transparency in decision making, the private sector did not trust government policies and actions. External players, particularly donors, were effective at highlighting the food crisis problem early on using existing data from various information sources. The government used relief measures to protect urban consumers, such as subsidized open market sales of food grains. A major challenge for the government was to provide information to civil society organizations and donors to guide interventions in vulnerable areas. Household level data was not available to identify those who were affected by the crisis, resulting in a blanket distribution of food. Connecting data to knowledge management and dissemination channels and using it for effective program implementation remains a challenge in Bangladesh.

Ethiopia: The Disaster Risk Management and Food Security Sector, an agency of the Ethiopian Ministry of Agriculture, played a crucial role in sounding early warnings of the food crisis. The agency, which was originally a response to the frequent droughts and famines of the 1980s, was reorganized in 2009 in response to the food crisis and has developed considerable capacity for the collection and sharing of food security data from various parts of the country. It also works with the Central Statistical Agency to generating information on the food security and nutritional status of the population. In addition, FEWS NET and the GIEWS program produce regular bulletins that share information and which have been used in decision making. During the food crisis, the national level response process was coordinated by the Ministry of Finance and the Prime Minister's Office with close consultations with the government-supported Economic Development Research Institute. NGOs were mainly used for food distribution in affected areas. The private sector played a limited role in transporting the food to areas where the prices were high during the food crisis. This is partly due to challenges of sharing information with the private sector and partly due to the infrastructure and transportation costs in shifting food to remote areas of the country.

The response to the food crisis was mainly organized by the public sector. The decision making process was minimally consultative, and when consultations did occur, the participants were invited to endorse the decisions that were already made by the policymakers. This reduced the enthusiasm of the

participants who had done their own analysis using the available data. While information was produced with the help of external technical assistance, the use of information from the monitoring system were less systematic. NGOs were not permitted to treat food security as a human right issue. Parliamentary debates were largely to support centrally-made decisions. Although early warning systems are well developed, the major challenge is to connect the information generated to the policymaking system in the food and agricultural sectors.

India: A combination of data sources provides information for policy responses to higher food prices in India. Regular national level food consumption surveys, Demographic and Health Surveys (DHS), and the National Nutrition Monitoring Bureau's FSNM surveys provide data for researchers to analyze and inform policymakers (Ramachandran, 2011). Thus there exists infrastructure for data collection and processing for regular surveys. However, during the food crisis due to limited time, the policymaking process involved selected public institutions for consultation who had to quickly develop "supporting evidence" for the decision proposed by the government (Personal interviews with the researchers). While the details of the discussions between the policymakers and the researchers remain confidential, there was some consultation with the stakeholder groups on the issues and potential policy options. Yet the use of information from the national monitoring systems was limited due to the political pressure the government was under to quickly develop policies to reduce the public's fears. This occurred because the opposition parties raised the issue of the high food prices in the Parliament of India. Civil society organizations used the opportunity to raise their commitment and support for the "Right to Food" agenda.

Policy think tanks provided information for policymaking through internally circulated policy briefs and presentations. India's Planning Commission provided policy advice as well, although it is not clear how much of the information it had disseminated originated from the monitoring system. In addition, the media played an effective role in circulating various groups' policy preferences. Farmers groups protested to increase their support from the government. International organizations provided information about global food prices. Advocacy coalitions of CSOs and farmers organizations that work toward protecting the poor and vulnerable continued to put pressure on the government. At the same time, market-oriented policy entrepreneurs cautioned the government against intervening too much and condemned the export ban as it would exacerbate the problem.

In summary, Indian policymakers relied on selected evidence and a vast majority of the policy researchers and analysts who analyzed household level information to argue their case were not effectively heard in the policy process. However, the consultative process recently proved to be quite different when the National Food Security Bill was being developed. There were ample opportunities for consultations and discussions on the costs and benefits of the program and the debate lasted almost three years. In the end, these debates also failed to fully utilize the analysis and research that stemmed from India's data collection and research systems, partly due to the political stickiness of the topic. Additionally, the analyses produced by the Planning Commission and the publicly funded institutions were not taken seriously by those who opposed the Bill.

Kenya: A food security taskforce provided the platform for discussion on both emerging and long-term food security issues in Kenya. Since 2000, its famine early warning system provided information through its monthly bulletin about at-risk populations and the vulnerability of various regions to food insecurity. During the food crisis, policy research institutions such as the Kenya Institute for Public Policy Research and Analysis, regularly published information on food prices in its publications. The inter-ministerial price committee and National Cereals and Produce Board (NCPB) used information on the food prices

and played a key role in determining the maize prices. Producer organizations, such as the Kenya Federation of Agricultural Producers and Cereal Growers Association (CGA), were influential in demanding policy action based on the food price information. In addition, processors' and millers' associations played a crucial role in setting and affecting the maize meal prices that prevailed in the market. However, the use of information for long-term policymaking in Kenya is ad hoc at best. Yet, during the food crisis, Members of Parliament, particularly in the opposition, raised their voices to protect the poor and the vulnerable. While the food security taskforce, which was comprised of public sector officials from various ministries dealing with food security issues, the private sector, and the NGOs helped in generating evidence for policy decision making, the generation of FSNM information needs to be mainstreamed in regular food security and nutrition policy making.

Malawi: The President of Malawi played a direct role in addressing the food crisis in the country. Due to this high level decision making, there was little opportunity for policy dialogue based on the FSNM information available. Several factors contributed to the government's speedy policy response: discussion in the media of the problem, pressure from the CSOs related to fertilizer policy and strategic grain reserves, and resistance to domestic trade restrictions from the private sector. Decreasing the domestic price of maize and helping farmers to produce more were seen as the President's major policy objectives. The politically motivated commitment to input subsidies for smallholder farmers drove much of the food policy process in the country. Global recognition of the country's efforts to address its food security problems in the recent past reinforced these bold yet prudent moves. Several insights emerge from Malawi's food crisis experience.

In the early 1990s, Malawi had decent decentralized infrastructure for data collection and analysis to address food security issues. However, high staff turnover resulted in irregular data collection from the field and hence inadequate analysis for designing program and policy interventions. Due to a lack of local capacity, Malawi continues to depend on external technical assistance to generate information about its food and nutrition policy issues. Analysis of policy alternatives continues to be done by donor-supported, external researchers, albeit in collaboration with local counterparts. There is a need to connect the FEWS NET that currently provides food security information at the regional level to household and community level data systems to design and implement interventions and to monitor the progress against CAADP goals.

Mozambique: An inter-ministerial committee was formed to develop policy responses to the high food prices in Mozambique. A major source of food security information was FEWS NET which regularly produced a monthly bulletin both in Portuguese and in English for more than a decade. The Ministry of Agriculture collected data on food production and agricultural commodities, albeit on an ad hoc basis, producing additional evidence for the development of intervention programs. However, there is no national-level infrastructure for regular data collection on food security and nutrition in the country.

During the food crisis, the implementation responsibilities rested on the Directorate of Economics in the Ministry of Agriculture which has limited capacity for monitoring and evaluation, knowledge management, and evidence generation. Despite the capacity challenges, the government responded by allowing imports of food grain which was successful in reducing the upward trend of food prices. Due to capacity challenges, efforts to develop a functional monitoring system for addressing food security issues on a regular basis has yet to be developed.

Nigeria: The National Food Reserve Agency, a specialized agency of the Ministry of Agriculture was initiated in 2007 and entrusted with developing a food security strategy for Nigeria. However, the

federal agency has limited capacity to undertake the analysis needed for strategy development. Its linkages with state ministries of agriculture are limited due to poor coordination and the absence of a formal chain of command mandating accountability of state ministries to the federal agency. Poor accountability between the state commissioners of agriculture and the federal ministry further reduced the possibility of generating a national level FSNM system.

At the state level, monitoring and evaluation units have inadequate human and physical capacity to handle information generation and processing responsibilities. The Agricultural Development Programs of the State, a project funded by the World Bank in the 1990 and 2000s, continue to generate information on agricultural production. However, their linkage to local development authorities are weak. Additionally, the recent decision to remove the responsibilities of the local government authorities to distribute fertilizer as part of the Agricultural Transformation Agenda reforms further distanced local knowledge sources from state agencies. However, during the food crisis, members of the Legislative Assembly, the Federal Ministry of Agriculture and Rural Development, state-level ministries of agriculture, the National Food Reserves Agency, the National Food Security Program, the private sector (especially rice millers), CSOs, the Agriculture Research Council of Nigeria, and other agencies were brought together for consultations to discuss the high food prices that the country was facing.

Policy inconsistencies, lack of continuity, and a shift of approaches by successive governments have made it difficult for participants of the policy process to effectively develop a systematic method of integrating information use in policymaking. Weak institutional arrangements for program implementation and inadequate feedback mechanisms to identify implementation challenges resulted in the selection of policy interventions with minimal impact. Even at the national level, monitoring and evaluation of federal food security programs continues to suffer from a lack of infrastructure and capacity for data collection, processing, and analysis.

Vietnam: Several committees were established by the government to develop solutions to the increases in food prices in Vietnam. The media, despite being government-controlled, raised the issue of food insecurity in various provinces during the food crisis. This pushed the government to act swiftly. Its reaction was to ban rice exports. Public research organizations in the Ministry of Agriculture collected and disseminated information on prices and production. The food crisis also stimulated the formation of coalitions of NGOs working toward food security. These coalitions have continued to engage in policy discussions after the crisis period. The major food policy decisions are made by the Prime Minister in consultation with the sectoral ministries. For example, the quantity of exports was determined in consultation with the Ministry of Agriculture and Rural Development (MARD), the Ministry of Industry and Trade (MOIT), and the Viet Food Association (VFA).

Senior policy advisors close to the government are usually consulted prior to making major policy announcements. Government decision makers regularly consult researchers who work in public research organizations for advice. However, due to the centralized nature of decision making in Vietnam, researchers find little room to actually discuss and debate policy options with policymakers. The information collected by monitoring systems is available to government agencies for use in their decision making processes. However, the public and private sector have to pay for access to this data. Thus, even with well-developed data collection infrastructure, analysis and use of information is limited. Further, household-level data on food security is only collected by national surveys, such as the Living Standards Measurement Survey conducted once in several years. Data gaps are filled by ad hoc surveys conducted by NGOs on a small scale and are not connected to policymaking systems.

Table 2. Characteristics of FSNM systems in selected developing countries during the food crisis

Country	Type of monitoring system	Key objectives	Infrastructure for data collection	Capacity for data processing, analysis, and interpretation	Timely generation of information	Commitment of decision makers	Impact of information on decision making
Bangladesh	Food policy monitoring system in the Ministry of Food	Monitor food production, prices, and stock levels	Data from the districts, food controllers, and household surveys	At the national level through externally funded projects	Regular joint sector reviews allow for sharing of information with policymakers	High level commitment to use data for determining the extent of food emergencies and the need for data.	National level policymaking benefits from macro systems; challenges prevail on assessing the impact of various interventions and refining them
Ethiopia	Various systems, both national and international	Monitor food prices, production, vulnerability	Regional offices mandated to collect information	Weak capacity in government NGOs fill time capacity gap	Timely information is produced by international agencies	High commitment of decision making to use information; high role of politics	Information used by donors to guide decision makers
India	Various systems in agriculture, food, and nutrition	Monitor food production and consumption	Highly developed infrastructure for data collection	High capacity for data processing and analysis	Regular bulletins on price and food availability	High commitment to policy responses but low level engagement with evidence/ information use	Analysis of information left to researchers who have limited access to policy makers
Kenya	FEWS NET provided regular information on food prices	Information price and production trends	Mostly data on price and food products; household level data collection was maintained	Capacity in government ministries is weak, some capacity in think tanks	Policy research think tanks provide information for decision making but was not systematic	Opposition party played key role in raising concerns and increasing the commitment of the government	Food security steering groups help in use of information for policymaking
Malawi	Various approaches, including famine early warning system	Food security vulnerability assessments	Good infrastructure to collect data	Capacity continues to be limited	Regular collection of data helps update information	Strong commitment and leadership of policymakers	Donors support groups that regularly met and demanded information for decision making
Mozambique	No nationally organized monitoring system; FEWS NET	FEWS NET monitors prices and food production	Weak infrastructure for data collection	Some capacity exists but needs strengthening	Information from filed delays due to poor capacity	Policymakers are committed but do not have capacity	Systematic use of information for decision making
Nigeria	No functioning food security monitoring in place	No well- defined objectives exist for monitoring	Data collection infrastructure exists but is poorly used	Capacity for data analysis weak in government agencies	Policy think tanks generated information but it was not timely and government did not use it	National food crisis response program but was not successful	Implementation challenges faced due to lack of information sharing among agencies
Vietnam	Well established food price monitoring systems in the Ministry of Agriculture	Information on trends and variations in food prices and food availability in the regions	Data collected through the existing channels of regional and district administration	Capacity for regular analysis of the data and connecting the food prices to the household indicators remains low	Food price data was available on time; but sharing with public was limited	Decision makers were highly committed but over reacted to price increase, hurting small scale producers	Information was not effectively used due to limited analysis and political pressure

IV. Lessons from the use of food security and nutrition monitoring systems in responding to the food crisis

The recent food crisis has provided an opportunity to take a hard look at the role of food security and nutrition monitoring systems in enabling better decision making in developing countries.

Connecting national systems to regional and global systems: Regional and global collaboration is essential for FSNM systems. For example, countries in a region with similar agro-ecological systems face similar food and nutrition security problems. They are also interconnected through increasing regional and global trade in food and face related food safety concerns. Regional and global organizations that depend on national systems for data collection and information on food security have a responsibility to develop, nurture, and maintain a network of researchers and analysts who work on food security and nutrition issues. Regular information sharing and presentation of data to policymakers can increase government commitment to FSNM systems and hence their sustainability. Further, intra-regional cooperation can help nations in recognizing the most pressing food and nutrition security problems which can help improve demand for FSNM systems and the information they produce.

Increasing information and decision making linkages: There is a need to involve high level policymakers in the design of monitoring systems in order to generate a stronger link between information collection and decision making. Policymakers are more likely to demand and use the information produced by FSNM systems if they value the importance of evidence and are confident of the quality of it. Institutions that collect and analyze data must be coordinated and/or strengthened in order to generate user friendly information that meets the needs of policymakers. The sustainability of FSNM systems crucially depends on maintaining continuous linkages between information generation and decision-making.

Cross-country learning: Given the increased frequency of food-related emergencies, regular collection of food security data at the household, community, market, and national levels is important for preventing food-related disasters. During the recent food crisis, countries that had functioning household-level FSNM systems were better able to undertake emergency planning. A steady flow of information on food security and nutrition helped to identify resource needs and hence to allocate resources to where they can be most effective. Monitoring the benefits of the intervention programs and the adequacy of delivery of program interventions can help in improving their efficiency. Thus, demonstrating the benefits of FSNM systems to policymakers can improve support and resources. Sharing experiences across countries, for example how one country effectively used its monitoring systems in decision making, can help other countries to respect the importance of FSNM systems and value its outputs. Additional case studies are needed to promote such cross-country learning.

Well-developed national systems contribute to global information: The recent food crisis also revealed that due to poorly developed national FSNM systems, there is a large information gap in the regional and global systems, even though they are well funded and have adequate infrastructure and capacity (UN, 2009). For example, a recent policy paper identified several key areas that could be strengthened to better track and predict global food security issues and food price changes. These include improving the quality of data on production, input, import tariffs, and policy responses. In addition, tracking data on various food value chains, from inputs to consumption, future food crises can be better predicted and hence more appropriate responses can be developed. Investment is needed to build local capacity

to use remote sensing technologies and to track input and output markets, local price information at decentralized markets levels, local wages rates, and tariffs (IFPRI, 2009).

Increasing the commitment of country governments: Most of the monitoring systems that contribute to information generation are currently funded by the donor community (for example, FEWS NET). However, a locally owned FSNM system is not likely to be sustainable without sufficient government commitment. Existing externally-driven systems should develop a strategy and timeline to create locally owned, national systems that policymakers feel ownership over and that they actively consult for decision making purposes.

Reorient donor funding toward capacity development: The case of Mozambique suggests that continued donor funding may be necessary when governments lack the resources to invest in monitoring systems. However, efforts must be made to slowly wean countries off donor support in order to increase local commitment and ownership. This will help the local systems to develop further. For example, in Ethiopia, the nationals system produces similar information as FEWS NET. However, resource constraints result in the delayed publication of information. Transferring responsibility to local institutions will require developing capacity for various FSNM activities at all levels. A larger share of development partners' current investments should be spent on developing such local capacity. Collaborating with national partners and employing local professionals would be good start to building this capacity. These locals could then form local private companies that could undertake contracts or assignments from the government (Collier, 2013)

Political economy of policymaking and information use: The experiences of India and Bangladesh clearly show that collecting and analyzing information alone will not lead to successful policy implementation. Policymakers and information users must be committed to the relevant food security issues and have the capacity to enact recommended policy options during non-crisis periods when food and nutrition issues compete with other, more politically favorable policies. Such considerations make it important for monitoring systems to employ staff who understanding the political dynamics of the country.

Increasing awareness of decision makers to the importance of evidence-based policy and program development: One possible means in which to increase the government's awareness of, and possibly responsiveness to, food and nutritional security challenges is to demonstrate how a policy problem could be effectively addressed through better information and informed debate. However, ignorance of the value of information produced by FSNM is not the only reason for the lack of government commitment to FSNM. Political fears can hinder commitment to the sustainability of FSNM systems. For example, monitoring a program or policy may appear risky to program managers if there is a chance that the evaluation will indicate that the program was not as successful as anticipated.

Streamlining the information base and creating synergy: The existence of too many early warning bulletins leads to confusion, slowing government and donor decision making. Often, three different donors collect and disseminate similar information using different systems of data collection. Decision makers should be assisted in identifying information needs and in understanding how to meet these needs through existing FSNM systems. User surveys are valuable to identify potential users and their information needs. To increase their confidence in the information produced by FSNM systems, as well as their commitment to food security issues, decision makers should be active participants in the system. Workshops for decision makers should be held on a regular basis to comment on the quality of the information delivered by the various monitoring systems.

Sustained investment in FSNM systems: Evidence-based decision making during the crisis and for long-term policy development requires sound monitoring systems that can provide timely information on the nature of the food security and nutrition problems and their causal factors. Interest and investment in monitoring systems over the last 30 years closely corresponds with the occurrence of the food crises. Policymakers do not give much importance to monitoring systems during non-crisis periods. Due to this unintended neglect, monitoring systems deteriorate and when the crisis hits, it is too late. As a result, the responses tend to be reactionary and do not result in effective programs or policies.

Keeping FSNM systems functional: Regular assessments of FSNM systems in terms of their relevance, effectiveness, efficiency, impact, and sustainability are essential, even in non-crisis periods, for regular policymaking. Such assessments are also useful for regional and global monitoring systems to be able to refine the quality of the data collected through national systems. Sharing lessons and experiences in monitoring and exchanging innovations via regional networks can help in reducing the deficiencies of national FSNM systems.

Improving the quality of information: Effective use of information by policymakers requires that they have confidence in the information produced. This requires high level oversight of the FSNM systems to assess their accuracy, dependability, and coverage. Decision makers will only find food and nutrition security information valuable if they can ascertain the quality of it. Consequently, FSNM information must not only be reliable, timely, and user-friendly, but also of high quality.

Producing timely and usable information: The time taken to process and analyze data and present it in a user-friendly format for decision making is key for the success of the monitoring systems. Lack of timely information renders much of the information unusable by decision makers. When developing an FSNM system, implementers should acknowledge the amount of time necessary for data documentation, communication, and policy intervention, as well as the time required before an intervention can have an impact. Institutional inflexibility often results in too long a time lag between the determination that a food emergency is at hand and the delivery of food aid to the people in need. Decision makers will often not act until they receive hard proof of a food crisis. There are also frequent time lags in donors' delivery of food aid to populations in need.

Challenges in targeting and choosing appropriate indicators: Without collection of the right indicators and monitoring of the vulnerable populations, it is difficult to develop effective programs and policies that combat food and nutrition insecurity. What is the appropriate threshold to say a situation requires an intervention? Should efforts be focused on the moderately malnourished who may be higher in number, or the severely malnourished, who may be fewer but face more dire conditions? How many of the moderately malnourished who are denied assistance will eventually become severely malnourished? FSNM indicators should capture a wide range of problems and their development over time in order to prioritize issues.

When choosing indicators to monitor, one must consider the accuracy, geographic-specificity, cost-effectiveness, reliability, and availability of data, as well as the timeliness and usefulness of the information. The more precise the information, the more costly it is likely to be. Indicators will vary depending on the type of monitoring system in place, although many of the above considerations will be applicable, regardless of the type of monitoring system. When choosing indicators to measure the impact of a policy or program, indicators should reflect the goals of the program and should measure the effects of the intervention. The percentage of targeted people actually being reached by the program should be determined. The proportion of people receiving services who are not targeted

should also be verified. In the case of early warning systems, indicators chosen must be able to forecast imminent food deficits. There must be a strong connection between the information tracked and the decision or response, as well as a system that triggers a quick response.

While gathering area- or group-specific indicators of food and nutrition security is ideal, it is often difficult to gather timely and accurate information at the household or individual levels. The quality and ease of access to such information often varies, depending on the country, the socio-economic group, as well as political and climatic conditions. While the objective should be to achieve a monitoring system that includes continuous and reliable composite indicators at the households-level to better understand long-term food and nutrition security issues, in the short term a set of national-level indicators should be identified and monitored on a consistent basis.

Information at the household and community levels: National level monitoring systems tend to focus on the national food supply or the aggregate or average level of poverty. Such information is usually not useful for decision making in terms of protecting vulnerable groups. Consequently, the GIEWS program made efforts to devote more attention to the sub-national level. For instance, the system gathers data on indicators “such as local market food supplies, retail price rises and evidence of individual and community responses to food insecurity” (UN, 2009). FEWS NET is moving in a similar direction, employing the livelihoods approach in monitoring food security in various countries. Yet national systems are still behind in collecting information at the household level on a regular basis.

Decentralization of monitoring systems: FSNM systems often collect data from the field but present aggregate information at the national level. Given that in the last 30 years many developing countries have decentralized their decision making systems for emergency and program interventions, increased capacity for collecting and analyzing data at decentralized levels, could enhance the effectiveness of many FSNM systems. Implementation of intervention programs could also be more effective if the decision makers at local levels use the data collected by the monitoring systems for their implementation and for program refinement during its early stages. Such decentralized capacity can also reduce the time between problem identification and action.

V. Concluding Remarks

FSNM systems for informed policymaking have experienced cycles of support and neglect corresponding to the frequency of food emergencies that countries face. Of the various types of monitoring systems, early warning systems are able to help policy decision making the most, although they tend to be externally driven and funded. Monitoring food security and nutritional status as part of regular policy making and program implementation processes is not yet mainstreamed in developing countries and as a consequence, policies continue to be developed and implemented on an ad hoc basis, even during crisis periods, as shown by country examples presented in this chapter.

Every time a food crisis hits a country either due to natural or manmade disasters, the policy system of a country is shaken up. Demand for information to devise policies and programs temporarily increases and policymakers discuss the need for strengthening data collection and surveillance systems and ensuring they address policymaking needs. This is true for regional and global bodies engaged in FSNM as well. As soon as the crisis subsides, however, monitoring systems are forgotten in terms of their use, their capacity, and their funding.

Lessons from the recent food crisis and the increasing frequency of the natural disasters seen in recent years, call for strategic investment in monitoring systems that will forewarn and reduce the damages

caused by food emergencies. Increasing the resilience of food systems is key to preparing countries to face future food crises. This in turn requires sound food policy institutions that are capable of designing policy and program interventions for the immediate, short-, medium-, and long-term. The role of evidence in this process is critical. Strengthening local FSNM systems also strengthens regional and global information systems. The systems operating at different levels cannot be seen as independent, since, harmony of data collection and analytical methods is critical to providing credible information to policymakers at all levels to swiftly develop policy solutions.

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